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ABSTRACT

The impact of advanced technology has increased computer usage at all levels as evidenced by the popularity of video games, increased interest on the part of students using computers to enhance learning, and business/school partnerships forming with such companies as Digital Equipment Corporation, International Business Machines, and Tandy/Radio Shack. Educators are now in a position to develop and implement programs and enter a new age of educational responsibility and decision-making. The U.S. Department of Education is interested in the role computer technology plays in education and has provided block grants via the Educational Consolidation and Improvement Act (ECIA), which have been used to purchase books and computer equipment. Teacher computer literacy is one area that needs further development, and to assist in alleviating this problem, the Office of Educational Research and Improvement (OERI) has distributed funds for programs directly related to improvement in this area. Other educational projects monitored by OERI include Project Quill, which uses microcomputers to help teachers teach writing; the development of a mathematics and reading curriculum and methodology to improve learning for elementary students, handicapped, gifted, and culturally diverse children; and the establishment of the National Diffusion Network (NDN), which provides funding for the dissemination of information about exemplary programs using technology in science and math. Individual "lighthouse projects" identified by NDN use computer-assisted instruction to improve basic skills for compensatory education, teach secondary math courses, provide occupational education, and/or utilize computers for records management and prescriptive instruction. (DJR)

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"Technology in Education: "Its Prospects and Its Promises"

by

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Keynote Address for
Seminar on Technology -- "Technology in Education: Where are WE?"

University of Missouri
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Good Afternoon.

It is a pleasure to be here in Kansas City and to be speaking before this very impressive seminar on a topic of vital national concern, "Technology in Education: Where Are We?"

Throughout the course of history there have been events and developments which have been so significant in their impact that they have brought lasting change to the world. We live in such an era. Advanced developments in the field of technology and computer usage are placing us on the threshold of what is now being referred to as the "information age." The business leaders and educators of our society who will determine the direction of our society in such an age are now forging the legacy that we will pass on to future generations. How we deal with the new technologies before us will determine in years to come who we are and what will be our place among nations.

We could try to ignore the reality of the situation before us. Many of our generation are uncomfortable with the notion of what the new technology portends. Many think that if they ignore it the computer will go away.

Young people, already, appear to be much more attuned to using the computer at all levels of its development. Witness the popularity of game arcades. Look at how quickly video games have displaced the old favorite, the pinball machine. Children are growing up with not only bicycles and rollerskating but Pac Man, Ms. Pac Man, and Super Pac Man. Young people in schools in almost all instances approach computer learning, when given the chance, with interest and enthusiasm. Even previously disaffected youth have found a new meaning to schooling when the computer becomes a part of their learning program. It has inspired many students to take another look at learning and decide it can be fun as well as useful.

We should not turn our backs on the students now in school, and those young people who will soon be entering the workforce, by pretending the computer does not exist. For, indeed it does, and it is creating a development properly called a revolution. The way we live, work, and play will all be affected. How we react to and deal with this reality will determine not only the future of students now in school but the legacy that we will provide to future generations.

You, the individuals who make up the audience here today --- deans of education, college of education technology experts, and those individuals responsible for teacher training are in a position to develop and implement programs that can determine how we meet the challenge.

Other advanced nations are moving rapidly into the world of technology. They are imposing rigid and demanding curriculum on their youth; they are intent on preparing them for their part in a workforce geared to a high tech society. Technological studies are an integral part of the school curriculum in Japan, Germany, and the Soviet Union -- all countries which have been cited as focusing heavy on education with their students producing impressive achievements. These countries, however, all operate under a centralized system--their schools are controlled by their national units of government.

Our schools operate differently. Under the educational system in the United States, the operation of the schools is by local education agencies operating under the authority of the individual State governments. This is as it should be. It is a concept which the Reagan Administration strongly

supports and which has served us well throughout our history. It provides for diversity and creativity at the local level while allowing a great amount of individual citizen input.

While the U.S. Department of Education is interested in the role computer technology plays in the educational arena, it will not get involved in dictating educational policy or curriculum to the States or to local school districts.

However, although the role of the federal government is a limited one, there is a non-intrusive federal leadership role which is important. The Reagan Administration, under the New Federalism, is trying to stimulate an atmosphere which encourages schools to get involved with instructional technology, to share information on technology, and to get the private sector more involved in instructional technology.

There are no plans to return to the type of programs offered in the 1960s in which large sums of federal dollars were spent on a wide range of educational projects with questionable results.

We are entering not only a new age in technology but a new age in educational responsibility and decision-making. For example, the Education Consolidation and Improvement Act (ECIA) or block grant approach has been turning decision-making authority and finances back to the States and local school authorities. The purpose of the block grants has been to reduce federal control while enhancing the decision-making process at the State and local levels.

Therefore, there is now more responsibility on State and local school officials to become aware of the advantages of instructional technology and how it can best be adjusted to local needs. They have the resources and

decision-making power to do something about it. Most interesting are the results of a new survey conducted by the American Association of School Administrators (AASA) which finds that the nation's school districts are placing a high priority on technology. The number one use of money from the block grant funds went to the purchase of books. The second largest expenditure was for computer equipment.

The block grants have provided school districts with federal funds that they did not expect to have. The AASA survey, the most comprehensive of its kind since the block grants went into effect on July 1, 1982, also shows that most of the expenditures, in the area of technology, was for computers and computer equipment.

When the block grant proposal was adopted, very few, if any, could perceive this use of the funds. However, once the funds and decision-making authority were put into the hands of local people, they were quick to respond to a real need--preparation of students for the technological age.

Very few districts have, however, used their block grant dollars to train teachers in how to utilize the equipment which has been purchased. This highlights one of the major problems of schools in attempting to teach computer usage to students--there are very few teachers who are computer literate.

Actually defining computer literacy is in itself difficult; laymen as well as experts have yet to agree on a definition. In its present context it could be used for anything from pushing a few buttons to doing programming. One of the components of the Office of Educational Research and Improvement, the National Center for Education Statistics, is holding

meetings of experts to examine the whole question of what is computer literacy and what constitutes competency in computer literacy. Suffice it to say, however, a teacher with no knowledge about computers and their usage is not going to be able to effectively utilize the technology offered by the computer in any educational program. The teacher will approach the computer with fear and trepidation, not confidence and creativity. We will have difficulty expecting a pre-Gutenberg trained faculty to deal with a post-Gutenberg world of technology.

To assist in alleviating this problem, the Office of Educational Research and Improvement through our Office of Libraries and Learning Technologies implemented a program in which it will distribute a total of \$100,000---\$10,000 to each of its 10 regional offices. The money will be used for programs directly related to improving teachers' skills and knowledge about the use of computers and technology in the classroom. These funds will be utilized as local needs dictate but with the purpose of assisting computer literacy for teachers.

The U.S. Department of Education can offer information and limited but targeted assistance for States and localities as they make the choice as to the priority level that technology will have within their individual educational programs.

At a National Teleconference on Educational Technology held on June 22, 1982, in Washington, D.C., Secretary T.H. Bell announced that technology would be one of his major initiatives in education. There were over forty-five state sites, including the one in D.C., that participated in two days of activities highlighting technology in education.

The Office of Educational Research and Improvement was selected by the Secretary to take the lead in implementing his initiative on technology. OERI has become involved with a number of interesting and exciting educational programs.

Our Office of Libraries and Learning Technologies is monitoring several contracts which utilize technology to improve the teaching of the basic skills. One of these is a communication program known as Project Quill. It uses a set of microcomputer-based programs around which several instructional activities have been developed. The activities are geared to young writers in grades 3 to 6. Quill utilizes the microcomputer's technological capabilities to help teachers teach writing. The youngster's natural enthusiasm for anything connected with the computer strongly motivates them to write and to perform the various tasks which are a part of the program. It has helped to eliminate the drudgery of rewriting compositions by hand. Corrections and rewrites can be made quickly on the word processor and a print-out secured.

A second project is in the field of mathematics. It is being designed by faculty at the Ohio State University. After reviewing existing programs using technology, education experts will develop and demonstrate a new curriculum and methodology designed to improve learning for the average student in the elementary grades which will have appropriate applications for handicapped, gifted, and culturally diverse children.

A reading project, directed toward the same population, will be designed by WICAT, Inc. of Orem, Utah.

The National Diffusion Network operates under the auspices of the Office of Educational Research and Improvement. Through the N.D.N. model educational programs which contribute to academic excellence are selected to receive funding for purposes of dissemination of information to other school districts throughout the country.

For example, an excellent program might exist in a school district in Missouri. It might be ideal for helping to solve an existing education problem in Massachusetts or Oregon, or California or Florida but how are teachers and administrators in those states going to be made aware of the program? Exemplary programs are brought to the attention of educators in other parts of the nation. Training and other assistance is provided. The option of whether or not to adopt a particular program is, of course, at the discretion of local school officials.

We have provided dissemination grants through the N.D.N. to regional offices and seven of ten projects related to technology. We have also focused our search for exemplary programs highlighting areas like technology, science and math.

As a result of the current emphasis on technology, the National Diffusion Network has awarded grants to five "Lighthouse Projects" in Technology. The Lighthouse Projects are designated as such because they are using technology to enhance education in an outstanding way. The federal grants will enable those schools to host visitors from all over the country and to provide material on their adaptations of technology to school use.

The response, so far, to these programs has been very positive. I have had the opportunity to personally visit four of the five Lighthouses currently in operation and I have been impressed with the effectiveness each has displayed with its particular use of technology. Some of the applications include:

- o a computer assisted instruction program developed to assist in the improvement of basic skills instruction for compensatory education students.
- o computer assisted instruction for secondary mathematics courses.
- o a regional alternative occupation education program in high technology for secondary school age youth, some of whom were previous school dropouts.
- o a program utilizing computers to improve reading and math skills and for the management of student records with cross-referencing information about prescriptive instructional materials that can help address skill deficiencies.

These projects are Project C.O.F.F.E.E. or the Cooperative Federation for Educational Experiences, Oxford, Massachusetts; The Merrimack Education Center in Chelmsford, Massachusetts; Asbury Park, New Jersey, Board of Education; The Evaluation Center, Hopkins Public Schools, Hopkins, Minnesota; and Project HOSTS (Helping One Student to Succeed), Vancouver, Washington.

Coincidental to and perhaps as a result of the computer revolution and the impact that computers are having on the schools, there has developed many very positive business/industry partnerships with the schools. This is a healthy trend which has found business responding in a favorable way to the needs of the schools.

President Reagan has been encouraging such partnerships. In his radio address to the nation made from Camp David on March 12, 1983, the President stated:

Private sector initiatives can also make great contributions. We're encouraging corporations, community organizations and neighborhood groups across the country to adopt schools and help them meet their education needs with funds, equipment and personnel.

There are already some examples of how business and industry are helping in a positive way to assist the schools, especially in the area of technology. Allow me to mention some specific examples:

- o The Digital Equipment Corporation located in Massachusetts has been instrumental in the implementation and operation of Oxford, Massachusetts Public School System's Project C.O.F.F.E.E. Project C.O.F.F.E.E., which stands for the Cooperative Federation for Educational Experiences, is an alternative occupation education program for alienated secondary school students. Its program consists of four components for each student: basic skills instruction, occupational training, counselling, and physical education. Digital has contributed both equipment and manpower time to this project. A computer center with both hardware and software has been contributed by Digital. It is in this computer center that many of the students receive the training in data processing which prepares them for entry-level positions in the computer field.

Teachers in the Project C.O.F.F.E.E. program receive training in electronic assembly as Digital's Westfield plant and in computers at Educational Services in Bedford, Massachusetts. This

partnership has gone a long way in providing Digital and other corporations and companies with a pool of individuals trained in the basic skills of technology from which they can hire.

In another program Digital donated a bus to the schools of one county and outfitted it with donated Digital Corporation equipment. Twenty four junior high schools will participate in a three year program which allows each school a one month use of the bus. As part of the program, three teachers in each school will be trained in the rudiments of computer programming and the principles of teaching and utilizing computer skills in the classroom. When the bus leaves a school, Digital will then give them five "robbins," desk top micro-computers, free of charge.

Recognized as an outstanding school/industry partnership, the Oxford School District and Digital received a presidential commendation from President Reagan's Task Force on Private Sector Initiatives in October of 1982.

Starting next fall, schools in three states will be offering courses which utilize computers and software which has been donated to them by International Business Machines Corporation as part of an \$8 million dollar effort to enhance computer literacy in schools at the secondary level.

IBM will donate equipment to 84 secondary schools in these three states including both public and private schools, as well as four teacher training institutions.

This "Computer Literacy Model Program" is designed to improve the knowledge about and use of computers by both students and teachers.

Just last month the Tandy Corporation/Radio Shack introduced an innovative program which offers free training in computer use for elementary and secondary school teachers throughout the United States.

Over the past few years Radio Shack has been offering free classes in computer education to more than 125,000 teachers. The success of that program led them to adopt their current, more widespread effort to assist educators in being able to learn about computers.

A package called "America's Educational Challenge" has been sent to the principals and headmasters of over 103,455 schools in the United States. Each package included:

- o an educator's handbook describing how microcomputers are used in schools.
- o a basic computer literacy package designed to teach elementary computer concepts.
- o a secondary-level textbook designed to illustrate programming concepts.
- o a list of examples of what several school districts are doing with computers.
- o a certificate for three free classes on BASIC programming and educational uses of computers.

Each school may also order a staff development package. We see this program as a complementary effort with the grants by the Secretary's Regional Offices for teacher computer literacy.